

Amendments to the Specifications:

In the Title:

Change the Title to:

Multijunction Solar Cell with a Bypass Diode having an Intrinsic Layer

On page 2: Please replace the amended paragraph that begins at line 2, page 1 of the present application with the following amended paragraphs:

This application is a continuation application of U.S. Patent Application Serial No. 10/280,593, filed on October 24, 2002, now U. S. Patent No. _____, which is a continuation-in-part of Application Serial No. 09/999/598, filed on October 24, 2001, now U. S. Patent No. 6,680,432.

This application is also related to co-pending U.S. Patent Application Serial No. 10/732,456, filed November 26, 2003, which is a continuation application of U. S. Application Serial No. 09/999,598, filed October 24, 2001, now U. S. Patent No. 6,680,432.

This application is also related to co-pending U. S. Patent Application Serial No. 10/336,247 filed January 3, 2003, which is a continuation application of U. S. Patent Application Serial No. 09/934,221, filed on August 21, 2001, now U. S. Patent No, 6,600,100, which is a division of U. S. Patent Application Serial No. 09/314,597, filed on

May 19, 1999, now U. S. Patent No. 6,278,054, which claims priority from U. S. Provisional Patent Application Serial No. 60/087,206, filed on May 28, 1998. U. S. Application Serial No. 09/753,492, filed January 2, 2001, now U. S. Patent No. 6,359,210, is also a division of Serial No. 09/314,597.

On Page 7: Please replace paragraph 4 (starting line 15) with the following paragraph:

If a cell is shaded or otherwise not receiving sunlight, in order for the current to choose the diode path 202, the turn on voltage for the diode path 202 must be less than the breakdown voltage along the cell path 201. The breakdown voltage along the cell path will typically be at least five volts, if not more. The Schottky contact ~~[[403]]~~111 requires a relatively small amount of voltage to “turn on” – 600 millivolts. However, to pass through the Ge junction 104, the bias of the Ge junction 104 must be reversed, requiring a large voltage. Reversing the bias of the Ge junction 104 requires approximately 9.4 volts, so nearly ten volts are needed for the current to follow the diode path 202 in FIG. 2A. Ten volts used to reverse the bias of the Ge junction is ten volts less than otherwise would be available for other applications. The device illustrated by FIG. 4 is therefore a functioning bypass diode, but an inefficient one from a power utilization perspective.

On Page 8: Please replace second paragraph (starting line 3) with the following paragraph:

The effect of the metal 107 is to “short” the Ge junction 104 to the base of the Ge cell 104. Because of the short, a minimal voltage is required to pass current between the layer 113 and the Ge substrate. No longer is a high voltage required to force the current through the Ge junction 104. The current flows easily through the “short path” 107. FIG. 2B provides a schematic representation. If the solar cell is shaded, no longer is the cell forced into reverse bias to pass the current of the array string. There is a much less resistive path, requiring a much lower voltage drop, for the current to pass through the bypass diode ~~[[202]]~~203. With the addition of the metallization 107, the Ge cell 104 is shorted. As a result, rather than a reverse biased diode with a 9.4 turn-on voltage, the current instead encounters an ohmic resistance path represented by the resistor 204.

On Page 17: Please replace fourth paragraph (starting line 20) with the following paragraph:

In one embodiment, a metal shunt 630 is deposited via well 650. One side of the shunt 630 is connected to the substrate 602 and another side of the shunt 630 is connected to the lateral conduction layer 610 and a portion of the triple junction cell 644. An anti-reflection coating 808 may be deposited over certain parts of the solar cell to enhance solar cell performance.

On page 26, in the Abstract, cancel lines 2-10 and substitute:

A multijunction solar cell including first and second solar cells on a substrate with an integral bypass diode having an intrinsic layer and operative for passing current when the multijunction solar cell is shaded. In one embodiment, a vertical sequence of solar

cells are epitaxially grown on a first portion of the substrate, and the layers of the diode are epitaxially grown on a second portion of the substrate with the layers of the bypass diode being deposited subsequent to the layers of the top solar cell.